torque decreasing means for decreasing a rotating torque of said motor when an accelerator pedal and a brake pedal of said electric vehicle are not operated while said holding period elapses a present maximum holding time.

REMARKS

In view of the foregoing, the objections to the drawings, the Substitute Specification, and Claims 4 and 10 are deemed fully addressed.

Likewise, reconsideration of the rejection of Claims 1-11 under 35 USC § 112, ¶ 2 is requested in light of the above non-limiting amendments to Claims 2, 3 and 5-10 as well as the submission of new Claims 12 and 13 in lieu of Claims 1 and 4, respectively.

The rejection of Claims 1, 2, 4, 5 and 9 as being anticipated by Takamoto et al. under 35 USC § 102(a) is traversed, and reconsideration is requested.

The torque (τo) referred to at page 4 of the Office Action is a torque instruction applied for running, not stopping, the vehicle. See for example, the discussion at col. 4, lines 36-48 of Takamoto et al. with reference to Figs. 3(c) and 4 where the torque instruction value R* is output as a control signal when the position control signal Sp is OFF. This must be contrasted with the present invention where a position control means calculates a minimum motor torque for keeping the vehicle in a stopped position. As a result, the present invention is able to achieve a substantial reduction in power consumption, something to which the Takamoto et al. patent is not addressed. Instead, it is directed to a selection between speed control and torque control, at the preference of the vehicle operation, with the selection switch.

With regard to the ability of Takamoto et al.'s control apparatus to hold the vehicle in a stopped position (col. 1, lines 59-63), we would note that the vehicle keeps a stopped position until the driver steps on the accelerator pedal after first stopping the vehicle at the slope. This means, however, that the vehicle continues to stay in the stopped position even if the driver does not continue to depress the brake pedal. This stopping comes at the expense of current continuing to flow in the motor, thereby undesirably consuming battery power.

The present invention is based upon more normal vehicle operation in which the driver continues to depress the brake during stopping. A motor torque is generated so that the vehicle stopped state is maintained only for a predetermined time, even if the accelerator pedal is not being depressed when the pressing of the brake pedal is terminated, to stop the vehicle. That is, even when the accelerator pedal is not being depressed by the driver, the motor torque is generated only for a predetermined set time. The maximum value of that set time is thus kept constant.

Consequently, with or without accelerator pedal actuation, the vehicle is prevented from rolling down the slope when the accelerator pedal operation is changed from the state where the brake pedal is depressed on the slope during the vehicle's stopped condition. In addition, because the time in which current flows in the motor to keep the vehicle stopped is short but sufficient for changing-over from the brake pedal operation to the accelerator pedal operation, the consumption of electrical power is minimized.

In the Takamoto et al. control apparatus, the time period in which the accelerator pedal is operated after the brake pedal is no longer operated, can be quite long. As a result, more current must flow to the motor. This is again in stark contrast to the present invention where the maximum value of that time period is specified so that the driver is aware that the vehicle is starting to proceed down the slope when there is no operation of the brake pedal or accelerator. Nevertheless, that time period is sufficient for allowing a normal shift of operation between braking and acceleration.

In view of the foregoing, the rejections of Claims 3, 10 and 11 as being unpatentable over Takamoto et al., of Claim 6 as being unpatentable over Takamoto et al. in view of Hotta, of Claim 7 as being unpatentable over Takamoto et al. in view of Hotta and Takahashi et al., and of Claim 8 as being unpatentable over Takamoto et al. in view of Hotta and Siepker, all under 35 USC § 103(a), are traversed. Reconsideration is requested on grounds that the hypothetical combinations, even if arguably obvious to make, would not teach the claimed subject matter. However, the rejections are based upon impermissible hindsight reconstruction and do not set forth a *prima facie* case of obviousness supported by substantial record evidence.

The assertion at the top of page 6 of the Office Action is, for example, the kind of "common knowledge and common sense" that were found insufficient in In re Lee, 61 USPQ2d 1430 (Fed. Cir. 2002). Reasoned findings based on record evidence are critical. The various "purposes" found by the Examiner for using the Hotta, Takahashi et al. and Siepker documents are based purely on

hindsight, not a clear teaching in any of those documents or in Takamoto et al. for making the combinations.

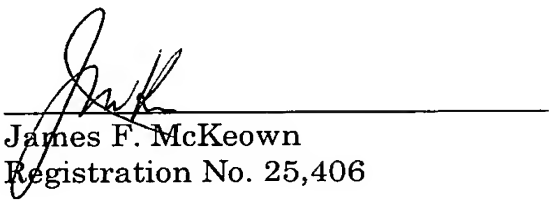
Accordingly, reconsideration and favorable action are earnestly solicited.

If there are any questions regarding this amendment or the application in general, a telephone call to the undersigned would be appreciated since this should expedite the prosecution of the application for all concerned.

If necessary to effect a timely response, this paper should be considered as a petition for an Extension of Time sufficient to effect a timely response, and please charge any deficiency in fees or credit any overpayments to Deposit Account No. 05-1323 (Docket #381AS/50990).

Respectfully submitted,

November 12, 2002



James F. McKeown
Registration No. 25,406

CROWELL & MORING, LLP
P.O. Box 14300
Washington, DC 20044-4300
Telephone No.: (202) 624-2500
Facsimile No.: (202) 628-8844

JFM/acd
056208.44743TCO

VERSION WITH MARKINGS TO SHOW CHANGES

IN THE CLAIMS:

2. (Amended) An electric vehicle, comprising a vehicle body, and means for keeping [a] the vehicle body at a [stopping] stopped position using rotating torque of an electric motor for driving the vehicle body [to run] when a brake pedal is [stepped on] depressed, wherein said rotating torque is calculated corresponding to an [operated quantity] amount of depression of the brake pedal, and means for keeping the vehicle body [is kept] at the [stopping] stopped position by generating [the] a calculated rotating torque in the electric motor.

3. (Twice amended) An electric vehicle according to claim [1] 12, wherein, when the brake pedal is stepped on under a condition that the vehicle body is at [a stopping] the stopped position by the rotating torque of the electric motor, the rotating torque is decreased and a quantity of motion of the electric vehicle is measured, and the electric vehicle is again brought [at] to the [stopping] stopped position by the rotating torque when said quantity of motion exceeds a preset value.

5. (Amended) An electric vehicle according to claim [4] 13, wherein said preset [period] maximum holding time is a time required for a driver of said electric vehicle to change from [stepping on] depressing the brake pedal to [stepping on] actuating the an accelerator pedal.

6. (Amended) An electric vehicle according to claim [4] 13, wherein after [elapsing] said preset [period] maximum holding time has elapsed, said rotating torque is gradually decreased.

7. (Amended) An electric vehicle according to claim 6, wherein an alarm is provided for getting [attention of] a [driver is given] driver's attention while said rotating torque is gradually being decreased.

8. (Amended) An electric vehicle [keeping] , comprising a vehicle body [at a stopping position using rotating torque of an electric motor for driving the vehicle body to run, said electric vehicle comprising the] , an electric motor; a control unit; a brake pedal; and an oil hydraulic pressure brake device operatively driven by said control unit, wherein said control unit [keeps] is operable to keep the vehicle body at [the stopping] a stopped position [by the] using rotating torque of said electric motor for a preset period from the time when said brake pedal is [off] not actuated after the vehicle body is stopped by [stepping on] depressing said brake pedal, and [keeps] is also operable to keep the vehicle body at the [stopping] stopped position by the oil hydraulic pressure brake device after [elapsing] said preset period has elapsed.

9. (Amended) A method of keeping an electric vehicle at a [stopping] stopped position using rotating torque of an electric motor for driving the vehicle body [to run when] , comprising depressing a brake pedal [is stepped on, wherein], calculating said rotating torque [is calculated] corresponding to an

[operated quantity] amount of depression of the brake pedal, and [the vehicle body is kept at the stopping position by] generating [the] a calculated rotating torque in the electric motor to keep the vehicle body in the stopped position.

10. (Amended) A method of keeping an electric vehicle at a [stopping] stopped position according to claim 9, wherein, when the brake pedal is [stepped off] released and again [stepped on] depressed under a condition that the vehicle body is at the [stopping] stopped position by utilizing the rotating torque of the electric motor, decreasing the rotating torque [is decreased and a quantity] , measuring an amount of downward motion of the electric vehicle on a sloping road [is measured], and again bringing the electric vehicle [is again brought at] to the [stopping] stopped position by the rotating torque when said [quantity] measured amount of downward motion of the electric vehicle exceeds a preset value.